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AMSAT NEWS SERVICE
ANS-041

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:
ans-editor@amsat.org

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SB SAT @ AMSAT $ANS-041.01
ANS-041 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 041.01
>From AMSAT HQ SILVER SPRING, MD.
February 10, 2013
To All RADIO AMATEURS
BID: $ANS-041.01

Mid-West USA High Altitude Balloon Launch on February 16

The Iowa High Altitude Balloon team says their iHAB-9 balloon flight is scheduled to launch February 16, 2013 at 16:00Z (9AM CDT). The Mission Control web page will give you flight status, an APRS tracking map, webcast, and live chat. Please go to:
http://www.ihabproject.com/iHAB-9/
http://www.ihabproject.com/iHAB-9/MissionControl/

On February 16 the flight schedule is presently at:
Webcast: 14:ØØZ - 8AM CDT
Launch: 15:ØØZ - 9AM CDT

The payload includes:

+ APRS beacon - WØOTM-11 on 144.39Mhz running OpenTracker+
  and Alinco DJ-C7 - VHF/UHF 3ØØ/5ØØmw

+ 2ØM QRP Beacon, 1.5 Watts on 14.057.85 +/- Mhz

+ 1.2Ghz live video downlink

The latest flight status and additional information can be accessed on the iHAB web pages.

[ANS thanks the iHAB-9 Team for the above information]

Amateur Radio Participates in ISS Plasma Thrust Shadow Experiment

On February 1, 2, 3, and on February 8, 9, 10 the Russian Central Research Institute of Machine Building (TSNIIMASH) conducted a space plasma experiment from the International Space Station to evaluate the shape of a "radio dead zone" which is expected to occur with the use of an on-board arcjet plasma source.

Future space exploration plans to use electric thrusters. Integration of electric thrusters causes an electromagnetic compatibility side-effect when highly ionized exhaust plumes of the thrusters may scatter RF-signals producing large "dead" zone for communications.

The SpEx Shadow experiment on the ISS activated an onboard arcjet source to inject a plasma plume in space. The amateur radio packet beacon operating on 145.825 MHz was activated to transmit a VHF sounding signal with time ticks. Due to refraction/scattering of the sounding signals in the exhaust plume, the shadow region would occur. Participating amateur radio stations noted the time tick to register loss of signal and re-acquisition of the 145.825 MHZ signal as the footprint caused by the plasma jet passed their geographic location.

An example of the ISS SpEx Shadowing Beacon can be found on the DK3WN SatBlog website at:

http://www.dk3wn.info:

RS0ISS]CQ,qAR,SR5GK-3:]ARISS - International Space Station
DK3WN]BEACON,RS0ISS*,qAR,SR5GK-3:SpEx SHADOW 20:30:57 *DL* 02-02-2013/
DK3WN]BEACON,RS0ISS*,qAR,SR5GK-3:SpEx SHADOW 20:30:39 *DL* 02-02-2013/

Additional details of the Shadowing Experiment are posted on the TSNIIMASH web site at:

http://knts.tsniimash.ru/Shadow/en/Default.aspx

[ANS thanks TSNIIMASH and Mike Rupprecht, DK3WN for the above information]

CubeSats Form Asteroid Mining Exploration Fleet

In an article posted on the SpaceDaily.com website, "Commercial Asteroid Hunters Announce Plans For New Robotic Exploration Fleet", Deep Space Industries claims it will send a fleet of asteroid-prospecting spacecraft out into the solar system to hunt for resources to accelerate space development to benefit Earth.

These "FireFly" spacecraft utilize low-cost CubeSat components and get discounted delivery to space by ride-sharing on the launch of larger communications satellites.

FireFlies with a mass of about 55 lb will first be launched in 2015

on journeys of two to six months. Starting in 2016, Deep Space will begin launching 70-lb DragonFlies for round-trip visits that bring back samples. The DragonFly expeditions will take two to four years, depending on the target, and will return 60 to 150 lb.

Read the full article posted at:
http://www.tinyurl.com/CubeSat-Explorer-Fleet (SpaceDaily.com)

[ANS thanks SpaceDaily.com for the above information]

PCSAT normal(?) operations resume

PCSAT (NO44) is again returned to users (but not usable until a few weeks when sun angles get better).

The variation of power available to PCSAT is inversely proportional to the "sun-to-orbitplane-angle" (viewable in Instantrack with the "E" and "D" keys. It is currently above 78 degrees. Once it went above about 65 degrees was our last successful commanding.

Recovery did not work this period. But we learned enough to be more successful in the Fall.

A "sun-to-orbitplane-angle" means PCsat's orbit is now over the day/night terminator meaning it is in full sun (no eclipses) with solar power coming in on the (weaker) side panels and little if any on the +Z face(best panel). Attitude is maintained by alignment with the Earth's magnetic field. It's the best time for a recovery (no eclipses to cause a reset), but the worst time for commanding. It is too weak to respond to the needed logon and 3 additional commands. Though it will be strong again as the sun angle improves (lower).

Then it will have better sun on the +Z face for commanding, but then it will be doing Eclipses. And even though we can then command it to turn off unnecessary loads, it does not have enough time before the next eclipse to charge up enough to survive the next eclipse.

What we did (re)learn is a condensed command method where we can put all 3 PCSAT low-power commands in a single packet (using the TNC's ^V pass character). That way, we only need a successful logon to complete the Restoration. 1) The CONNECT ACK. 2) The password challenge, 3) Then the command prompt. Then we can hit it with the full low-power command set and disconnect all in one packet which cancels the need for PCSAT to respond to each command separately.

On the FIRST day available in full sun(our best shot), I not only got logged on, but completed all 3 requried functions. Then signals sounded so good, I got greedy and put in the another three (which also improves power budget, but not as much as the first three). Yep, I gambled and lost. It died on the last one! The next day I got all 3 in, and it died on the 3rdcommand due to a user packet I think. Days since, I have been unable to logon. Hence, end of this attempt period.

In most attempts in the past (after successful logon) we would send one command at a time to give it a few seconds rest between each one. But these 3 commands then required 3 ACKS and 3 RESPONSES in addition to the 3 required to get logged. Those extra 6 packets kill it, especially if there was a user packet in there. Next time all we need are the 3 loggon responses.

Also, next time, we will give users advance warning to QRT all transmissions when we are trying to command. Each one of their packets robs us of power we need to complete the command. I failed to warn everyone this time, and so we had some interference.

As sun angle improves, You may continue to experiment with PCSAT during MIDDAY passes. That is when it is strongest (in the Northern Hemisphere), but do limit yourself to only attended operations so humans can actually contact humans, or if you are doing an unattended test, keep your transmissions to once every 2 minutes. That should let you get one good successful packet per pass. Which is the mission of PCSAT.

See the downlink on http://pcsat.aprs.org

There you can see the telemetry packets (list at the bottom of page) right now are rarely getting above 001 meaning typically a minute or so of life before it gets overloaded and resets back to 000.

It is easy to visualize the relationship of the sun angle to the orbit plane and to see how that affects power budget given that our best panel (out of 5) is on the +Z face and that is magnetically aligned to point towards magnetic South. There is NO panel on the -Z which is why PCsat is rarely usable in the Southern Hemisphere (not planned, but just a result of it crashing in every eclipse).

Just thought you would like to know what is going on with one of the oldest student projects in space that is still "semi-operational" for users.

[ANS thanks Bob, Wb4APR for the above information]

AMSAT-UK to provide Amateur Radio payload for ESEO satellite

AMSAT-UK will be providing a 1260/145 MHz FM transponder and a 145 MHz BPSK telemetry beacon for the European Student Earth Orbiter (ESEO). This is the third mission within the European Space Agency’s
Education Satellite Programme.

Nine European universities will be working with the prime contractor ALMASpace, Italy, on the mission. Cranfield University in Bedfordshire will be supplying a small sail that will be deployed to demonstrate the de-orbiting of spacecraft at the end of the mission.

The primary purpose of the AMSAT-UK payload is to provide a downlink telemetry that can be easily received by schools and colleges for educational outreach purposes. The data will be displayed in an attractive format and provide stimulation and encouragement for students to become interested in all STEM subjects in a unique way.

The target audience is primarily students at both primary and secondary levels and the project includes the development of a simple and cheap “ground station” operating on VHF frequencies
in the
Amateur Satellite Service. This station is an omni-directional antenna feeding a FUNcube DonglePRO+ SDR receiver which will receive the signals direct from the satellite and transfer the data to specially developed graphical software running on any Windows laptop.

More information is available at
http://www.uk.amsat.org/?p487

[ANS thanks Trevor Essex, M5AKA for the above information]

OSCAR-11 ANNUAL REPORT 2012

This report covers the period from 01 January 2012 to 01 January 2013. During this time there have been no significant changes apart from the gradual drift of the on-board clock. The satellite has been transmitting on a regular cycle of 10.35 days on followed by 10.35 days off.

OSCAR-11 (AKA UoSAT-2 and UO-11) celebrated it's 28th birthday in space on 01 March! It was designed, built and launched within a period of six months, using commercially available 'off the shelf' components (COTS). Once again, congratulations to Professor Sir Martin Sweeting G3YJO, his team at the University of Surrey and the groups of radio amateurs who also contributed to the project.

Good copy has been obtained obtained from decoded telemetry frames and many reports have been posted on the DCARR general satellite status website, The satellite continues to be subjected to eclipses during each orbit, resulting in weaker signals at those times. During the summer in the UK all passes were in sunlight, however the eclipses gradually returned during the autumn and now all evening passes are eclipsed and signals are significantly weaker than in the morning passes.

The on-board clock gained 85 seconds during the year, which is comparable with the 60 seconds gain per year when the satellite was launched. There is however a large accumulated error of 308.54204 days slow. This was caused mainly by the clock stopping during eclipses, when there was also an unknown drain on the power supply. The units of the least significant digit correspond approximately to seconds (0.86 seconds actually).

At the present time, while OSCAR-11 is operating in a predictable way, please DO NOT send reports or files by e-mail. However, could all listeners continue to enter their reports on the general satellite status website. This is a very convenient and easy to use facility, which shows the current status of all the amateur satellites, and is of use to everyone. Reports around the expected times of switch-on and switch-off are of special interest, especially for times 13:00 to 18:00 and 22:00 to 08:00 UTC, to when the satellite is out-of-range in the UK . The URL is
http://oscar.dcarr.org/index.php

The VHF beacon frequency is 145.826 MHz. AFSK FM ASCII Telemetry. The satellite is operating in the default mode, controlled by the watchdog timer, with a cycle time of 20.7 days. 10.35 days on followed by 10.35 days off.

An extended version of this report is available on my website, and new listeners to OSCAR-11 should read this for further information. The URL is www.g3cwv.co.uk/oscar11.htm . This page contains links to the report, a short audio clip to help you identify the satellite and a file of recent telemetry received. The website also contains an archive of news & telemetry data which is updated from time to time,

and details about using a soundcard or hardware demodulators for data capture. There is also software for capturing data, and decoding ASCII telemetry. The easiest way to check whether OSCAR-11 is operational is to look at the General Satellite Status website http://oscar.dcarr.org/index.php .

If you place this bulletin on a terrestrial packet network, please use the bulletin identifier $BID:U2RPT158.CWV, to prevent duplication.

[ANS thanks Clive Wallis, G3CWV for the above information]

UKube-1 to launch in June 2013

The Herald newspaper reports that the CubeSat UKube-1 will be launched in June, 2013.

The spacecraft is being built for the UK Space Agency (UKSA) by Clyde Space and the launch will take place from Baikonur in Kazakhstan on a Soyuz-2 along with TechDemoSat-1.

The newspaper reports that Clyde Space has announced plans for a base in the United States.

UKube-1 will carry a set of AMSAT-UK FUNcube boards to provide an amateur radio 435/145 MHz linear transponder and a 1200 bps BPSK beacon for educational outreach

[ANS thanks Trevor, M5AKA for the above information]

Five new CubeSats hope for 2013 launch

Five new CubeSats being developed in Taiwan, Vietnam and the United States are hoping to fly during 2013.

PACE is the first nanosatellite developed the National Cheng Kung University (NCKU) of Taiwan and has the objective to provide a platform for attitude control experiments in space.
More Information is available at
http://satellite.ncku.edu.tw/pace/en/home.htm

TARO is a 2U CubeSat developed by the National Cheng Kung University (NCKU) of Taiwan. TARO is the precursor of PACE satellite which was also developed by NCKU and has an objective to verify the function of sensors and actuators which have been used at PACE.
More Information is available at
http://satellite.ncku.edu.tw/pace/en/home.htm

PicoDragon is a 1U CubeSat project intended to take low resolution earth images and to test on board systems. Planning to use two UHF transmitters. One 100mW CW beacon on 437.250 MHz and a 1k2 AFSK 800mW AX25 telemetry downlink. Commands will be uplinked on VHF.
More Information is available at
http://vnsc.org.vn/

United States, Alabama – ChargerSat-1. The primary mission is to perform a technology demonstration of gravity gradient stabilization,

improved solar collection and improved horizon communications on a pico-satellite. This is the team's first CubeSat and is a technology
demonstration of their capabilities as students
More Information is available at
http://space.uah.edu/

United States, California – SNAPS. This spacecraft has dimensions of
25x113x113mm, has a mass of less than 0.5kg and is intended to image other CubeSats autonomously using H264 compression. The team is proposing a UHF downlink using 9k6 AFSK and will utilize Carpcomm ground stations.
Planned for a SpaceX flight from Vandenberg AFB in April 2013 together with POPACS.

[ANS thanks Trevor, M5AKA for the above information]

ARISS News

ARISS Switches to Ericsson Radio After experiencing Problems with tthe Kenwood D700

After experiencing issues with the Kenwood D700 on two consecutive school contacts, ARISS will use the Ericsson Radio on the Columbus module for ARISS contacts until problems with D700 are resolved.

According to Frank Bauer, KA3HDO, AMSAT's Vice President for Human Spaceflight Programs, "...for some reason, our signals from the Service Module Kenwood D700 radio are much diminished. Our contact with Israel last Sunday had low audio levels, with good signals only near TCA. Our contact yesterday with the Hospital for Sick Children was even worse. Only one student was able to talk to Chris Hadfield before we lost the signal. The crew reports hearing the ground station well. Both these contacts were with our telebridge stations, some of the best out there. Also note that Chris Hadfield got on the IP Phone, immediately after the Hospital radio contact and answered all the student's questions, using that communications medium.
So,
while not optimal, we were able to make both these ARISS events successful

After the Hospital contact, we had a full court press to revise uplinks and procedures to use the Ericsson radio that was recently installed in the Columbus Module instead of the D700. This was worked well into the crew sleep period, with the procedures ready for the crew at wakeup. While we had not fully checked out the radio, we felt the benefits of using this system outweighed the risks of using the D700, given its recent past performance. Our contact with the Japan school, using the Columbus Module Ericsson radio was very successful. We plan to use it on the contacts planned for next week."

+ Contacts scheduled for this coming week

ARISS is requesting listener reports for these contacts. Due to issues with the Kenwood radio that are not fully understood at present, the Ericsson radio is going to be used for these contacts. ARISS thanks everyone in advance for their assistance.

Breadalbane Academy, Aberfeldy, United Kingdom, telebridge via W6SRJ
Contact is a go for: Tue 2013-02-12 09:22:57 UTC 26 deg

Chief Peguis Jr. High, Winnipeg, Manitoba, Canada, telebridge via
VK5ZAI
Contact is a go for: Wed 2013-02-13 19:47:43 UTC 55 deg

+ At the following link you will find a listing of all scheduled
  school contacts, and questions, other ISS related websites, IRLP
  and Echolink websites, and instructions for any contact that may
  be streamed live.
  http://www.amsat.org/amsat/ariss/news/arissnews.rtf

+ QSL information may be found at:
  http://www.arrl.org/ARISS/arissfaq.html
  http://www.rac.ca/ariss/oindex.htm#QSL's

+ ISS callsigns: DPØISS, NA1SS, OR4ISS, RSØISS

+ There have been rumors in the past indicating that the ISS was
  having direct contacts on the 40 meter band. The HF antenna is
  mounted, however, there is no HF radio equipment on board.
  Sometimes WA3NAN will retransmit shuttle audio.

[ANS thanks ARISS and AJ9N for the above information]

Satellite Shorts From All Around

+ The FITSAT-1 optical experiment is the topic of an article posted
  at Space.com. See "Tiny Japanese Satellite Beams Morse Code Messages
  from Space", by Leonard David at:
  http://tinyurl.com/ag47bed   [Space.com]

+ The AMSAT mail list archives remain accessible despite the temp-
  orary outage of general content at www.amsat.org. Access the the
  amsat-bb and sarex lists can be found at:
  http://www.amsat.org/amsat-new/tools/maillist/
  Access to subscribe to AMSAT mail lists can be found at:
  http://www.amsat.org/mailman/listinfo
  Access the AMSAT News Service Archives can be found at:
  http://amsat.org/pipermail/ans/   [Joanne Maenpaa]

+ Who is On Board the ISS

  Exp. 33/34
  Oleg Novitskiy
  Kevin Ford KF5GPP
  Evgeny Tarelkin

  Exp. 34/35
  Chris Hadfield KC5RNJ/VA3OOG
  Roman Romanenko
  Tom Marshburn KE5HOC

  [ANS thanks Charlie AJ9N for the above information]

+ Near Earth asteroid 2012 DA14 will pass inside the geostationary
  satellite orbits February 15. This object will make an extremely
  close approach to within 0.00023 AU of Earth at 19:25 UT (11:25 AM
  PST) on February 15, 2013.

For more information visit
http://echo.jpl.nasa.gov/asteroids/2012DA14/2012DA14_planning.html

[ANS thanks Tom Clark K3IO for the the above information]

+ Hello Kitty in Near Space
Near space weather balloon built by seventh grader Lauren Rojas and launched with help from her father, Rod, Reaching an altitude of over 90,000. The photography in this video is quite good, especially when the balloon bursts.

YouTube Video
http://www.youtube.com/watch?v=EsCTG4-Gg

/EX

In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
EMike McCardel, KC8YLD